AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions of claims in the application.

1. – 23. (Cancelled).

24. (Currently Amended): A communication control ~~system~~ method for controlling communications performed between a plurality of communication stations that are connected to communication paths being multiplexed with a main path and a sub-path, the communication control ~~system~~ method comprising:

~~first communication function implementing sections which are multiplexed so as to correspond with the main path and the sub-path respectively, and each of which is configured to implement~~ implementing a first communication function in a physical layer of an OSI hierarchical model;

multiplexing the first communication function so as to correspond with the main path and the sub-path respectively;

~~second communication function implementing sections which are multiplexed so as to correspond with the multiplexed first communication function implementing sections respectively, and each of which is configured to implement~~ implementing a second communication function in a data link layer of the OSI hierarchical model;

multiplexing the second communication function so as to correspond with the multiplexed first communication;

~~a high-priority communication section configured to perform~~ performing a high-priority communication via the first communication function ~~implementing section~~ and the second communication function ~~implementing section each corresponding to~~ over any one of the multiplexed communication paths; and

~~a low-priority communication section configured to perform~~ performing a low-priority communication via the first communication function ~~implementing section~~ and the second communication function ~~implanting section each corresponding to~~ over the sub-path,

wherein the high-priority communication ~~section~~ and the low-priority communication ~~section~~ coexist in a single communication station,

wherein the second communication function ~~implementing section~~ includes:

~~an address storing section configured to store~~ storing MAC addresses corresponding to the high-priority communication ~~section~~ and the low-priority communication ~~section~~ respectively;

~~a transmitting section configured to attach~~ attaching the corresponding MAC address to a communication frame depending on whether a transmission requestor is the high-priority communication ~~section~~ or the low-priority communication ~~section~~, and ~~configured to transmit~~ transmitting the communication frame to the communication path; and

~~a receiving section configured to compare~~ comparing a destination MAC address of a communication frame received from the first communication function ~~implementing section~~ with the stored MAC address ~~stored in the address storing section~~, and when a match is found in the

in the comparison result, ~~configured to send~~ sending the received communication frame to the corresponding communication ~~section~~ function,

wherein a router ~~configured to perform~~ that performs a path control of the communication path in accordance with Internet Protocol is provided on the communication path, and the communication path includes a plurality of sub-networks being interconnected by the router, and

wherein a sole master station exists on the sub-network,

wherein the master station transmits an inter-network diagnosing frame including path state information on the paths between ~~the~~ a home station and all another communication stations existing on the sub-network to which the home station belongs and path state information on the path between the home station and a master station existing on a sub-network to which the home station does not belong, and

wherein said method on each of all communication stations on the plurality of sub-networks including the master station and the other communication stations includes:

~~a path state~~ storing ~~section configured to store~~ path state information indicating whether the communication path from the home station to each of the another communication stations is sound;

~~a diagnosing message receiving section configured to register~~ registering in the stored path state information ~~storing section~~ the path state between the home station and the communication station existing on the sub-network to which the home station does not belong, based on the path state information included in the inter-network diagnosing frame; and

~~a data transmitting section configured to select~~ selecting either the main path or the sub-path in accordance with the information in the stored path state ~~storing section, and performs transmission of~~ information to transmit data.

25. (Currently Amended): The communication control ~~system~~ method according to claim 24 or 34, further comprising:

~~a selecting section configured to generate~~ generating a list of network addresses of all communication stations existing on the sub-network, and in a case where an address of the home station is the address that is uniquely determined among the list based on a predetermined condition, ~~configured to cause~~ causing the home station to operate as the master station on the sub-network.

26. (Currently Amended): The communication control ~~system~~ method according to claim 24 or 34, wherein the high-priority communication ~~section is configured to perform~~ performs communication in accordance with a protocol dedicated to process control, and

the low-priority communication ~~section is configured to perform~~ performs communication in accordance with an open standard protocol.

27. (Currently Amended): The communication control ~~system~~ method according to claim 24 or 34, wherein the high-priority communication ~~section is configured to transfer~~ transfers at least one of process data, an operation amount and an alarm, and

the low-priority communication ~~section is configured to perform~~ performs at least one of image data transfer, file transfer and message transfer.

28. – 33. (Cancelled).

34. (Currently Amended): A communication control ~~system~~ method for controlling communications performed between a plurality of communication stations that are connected to communication paths being multiplexed with a main path and a sub-path, the communication control ~~system~~ method comprising:

~~a high-priority communication section configured to perform~~ performing a high-priority communication normally via the main path;

~~a low-priority communication section configured to perform~~ performing a low-priority communication via the sub-path;

[[a]] path diagnosing ~~section configured to diagnose~~ a soundness of the main path and the sub-path; and

[[a]] switching ~~section configured to switch~~ the communication path of the high-priority communication to the sub-path when the main path is diagnosed as faulty as a result of ~~diagnosis by~~ the path diagnosing ~~section~~,

wherein the path diagnosing ~~section~~ includes:

~~a path state~~ storing ~~section configured to store~~ path state information of a path state from a home station to each communication station; and

[[a]] fixed-cycle path diagnosing ~~section configured to diagnose~~ the communication path from the home station to each communication station in a fixed cycle,

wherein the fixed-cycle path diagnosing ~~section is configured to register~~ registers the path state information obtained from ~~the diagnosis~~ a result of the fixed-path diagnosing, in the stored path state ~~storing section~~ information,

wherein the fixed-cycle path diagnosing ~~section is configured to broadcast~~ broadcasts a path diagnosis packet in accordance with a multicast protocol of Internet Protocol,

wherein different IP multicast addresses are assigned to the main path and the sub-path respectively,

wherein each communication station ~~is configured to perform~~ performs broadcasting by using the IP multicast address corresponding to a path selected between the main path and the sub-path, as a destination IP address, and ~~is configured to receive~~ receives a path diagnosis packet of which destination IP address matches with the IP multicast address corresponding to each of the main path and the sub-path,

wherein a router ~~for performing~~ that performs a path control of the communication path in accordance with Internet Protocol is provided on the communication path, and the communication path includes a plurality of sub-networks being interconnected by the router,

wherein a sole master station exists on the sub-network,

wherein the master station ~~is configured to transmit~~ transmits an inter-network diagnosing frame including path state information on the paths between ~~the~~ a home station and all another communication stations existing on the sub-network to which the home station belongs and path state information on the path between the home station and a master station existing on a sub-network to which the home station does not belong, and

wherein said method on each of all communication stations on the plurality of sub-networks including the master station and the other communication stations includes:

~~a path state~~ storing ~~section configured to store~~ path state information indicating whether the communication path from the home station to each of another communication stations is sound;

~~a diagnosing message receiving section configured to register~~ registering in the stored path state information ~~storing section~~ the path state between the home station and the communication station existing on the sub-network to which the home station does not belong, based on the path state information included in the inter-network diagnosing frame; and

~~a data transmitting section configured to select~~ selecting either the main path or the sub-path in accordance with the information in the stored path state ~~storing section, and performs transmission of~~ information to transmit data

35. – 36. (Cancelled).